

A Proposed Internal Cable Scheme for DeCam

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Introduction

The current proposal has a 1 cm x 7.5 cm connected to a connector mating with the connector mounted to the AIN board. The narrow width is necessary for access to the connector mating screws. The length is necessary to have enough space to mount the parts needed for a preamplifier and to drive the clock lines. This scheme may have problems. First it sticks out quite a distance. Added to this distance is the space needed to bend the cables. Since the cables bend in only one direction, this could limit connector positions to two faces of the dewar. The long, narrow board is usually not efficient for mounting components. A design for the cable card is proposed that solves several of these problems.

A Proposed Cable Design

Figure 1 outlines a possible cable design. With this design a short flat cable connects the mate for the AIN connector to the Cable Card. The Cable card lives in the space just behind the Cold Plate that mounts the precision foot that is glued to the AIN plate. Figure 1 shows the card as being square. A better form factor might be 2 cm x 6 cm with the 2 cm space being behind the mounting plate.

The cable card flat cable and connector are threaded through a slot in the Cold Plate and the Precision Foot. This short cable now bends in a direction that allows good access to the screws that hold it to the AIN board.

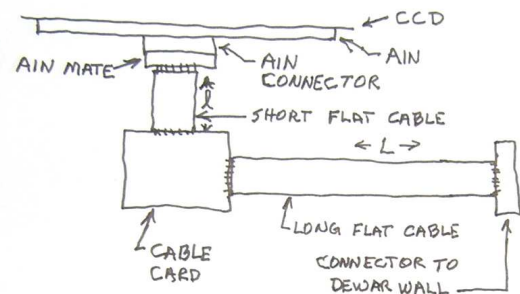


Figure 1. Proposed Cable Design

The cable coming off the Cable Card at right angles now bends in a direction that allows it to reach any face in the detector by suitable planning of cable routs. In general, cables should be routed inside the dewar for ease of placement. Outside the detector round cables will allow unscrambling any problems the inside routing create.

The length 'L' can be varied to allow several rows of connectors through the wall as sketched in Figure 2. It depends on how much space is available behind the Cold Plate. One layer might be enough with the ability to reach any face of the dewar that this design provides. Possibly we can get by with as little as 3 cm between the Cold Plate and the LN2 Vessel.

It is assumed that the LN2 Vessel can be detached from the braids that connect it to the Cold Plate. When this is done all the cables are available for the servicing of a CCD or cable.

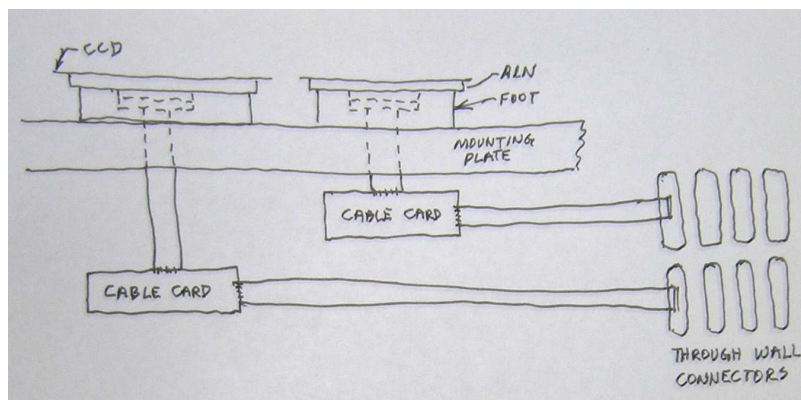


Figure 2. Scheme for several layers of cables in dewar

Electronics

The electronics on the cable card accomplishes everything for which lead lengths are critical. Once beyond the cable card, the “L” length might be very long. Possibly enough to get down from the telescope to the observatory floor. Key protection takes place on the Cable Card. After that, normal shielding might suffice in an environment where there is no lightning.

Some Comments

Advantages

- 1) The “I” cable of Figure 1 allows bending for ease of making the connection to the AIN board.
- 2) The “L” cable of Figure 1 can be long and can be bent in a direction that allows reaching any face of the dewar for which routing can be solved.
- 3) Since it comes after the Cable Card the “L” length is not critical.
- 4) The Cable Card can be made to fit the space behind the CCD which is otherwise unoccupied.

Disadvantages

- 1) This configuration requires on more set of soldered connections.